

Urban Environmental Management Project (UE)

1. Research Theme

“Integrating Global Concerns into Urban Environmental Management in Asia”

The third phase research focus of the Urban Environmental Management project will be how to integrate global environmental concerns into local management and planning, taking greenhouse gas emission reduction as an ultimate goal. We build our rationale on the common understanding that human activities in cities have profound environmental impacts far beyond city boundaries. The linkage between cities and global environmental concerns will grow stronger. In a couple of years, more than half of the human population will be urban dwellers. The global environmental impact of cities has an even higher share, considering the fact that cities often enjoy a higher level of consumption, and that many industrial activities take place in cities. In fact, many of today's global environmental issues can be traced back to human activities in cities. Taking energy consumption, which is one of the largest contributors to greenhouse gas emissions, as an example, some research suggests that more than 80% of all energy used is within cities.

On the other hand, looking at the reality of developing country cities in Asia, we also recognise that global concerns are not a top priority for urban environmental managers. Environmental concerns in these cities often mean more immediate and pressing local issues such as poor sanitation and health problems, air and water pollution, and improper solid waste management. However, these cities both contribute to and face the consequences arising from global environmental change. In fact, our first phase study reveals that the environmental problems faced by today's developing country cities in Asia are more complex, and that they are presented with the global environmental challenges at an earlier development stage than that experiences by developed country cities. Reflecting these realities, we will look at global concerns in Asian developing country cities, but with a close connection with local concerns such as air pollution and solid waste management.

The proposed research theme has strong linkages to and follows on from the research outcomes of the first and second phases of the UE project. During the first phase, we worked on the current status and change patterns of urban environment in Asian cities, identified challenges and dissected them into different types, and analysed the patterns, processes and mechanisms of urban environmental change over time. As mentioned above, we found that cities are facing a much more complex mix of challenges in a compressed way, compared to developed country cities, which highlights the necessity of addressing global concerns at an earlier stage, and together with local pollution issues.

The work on solid waste management conducted during the first phase will be continued and developed in this phase, to identify policies and strategies that have greenhouse gas reduction potential. During the second phase, we worked on an urban energy inventory and trends in Asian mega-cities. We found that energy consumption (and thus greenhouse gas emissions) in these cities shows a rapid increasing trend. The transportation sector, which is thought to be the fastest growing energy consumption sector as well as the most promising sector for integrating air pollution control with greenhouse gas emissions, will be our another important sectoral focus for specific policy recommendations in the third phase.

2. Objectives

The primary objective of our third phase research is to explore the ways of bringing global environmental concerns into local environmental management in developing country cities in Asia. Two strategic targets are set under this overall objective:

- Air pollution control in the transportation sector by means of enhancing the performance of automobiles, adaptation of cleaner fuels, increasing the share of public, mass and non-motorised transport, and urban planning tools
- Improvement of solid waste management by means of reducing, reusing, recycling, recovering and improving residual management

3 Project Design

3.1 Schematic design

The common research questions for the third phase are: “What are the barriers and opportunities in bringing the global to the local?”, and “How to find the right options and make them happen?” In our research, these questions will be visited repeatedly, but from different angles.

The research design of the project is shown schematically in **Fig. 1**.

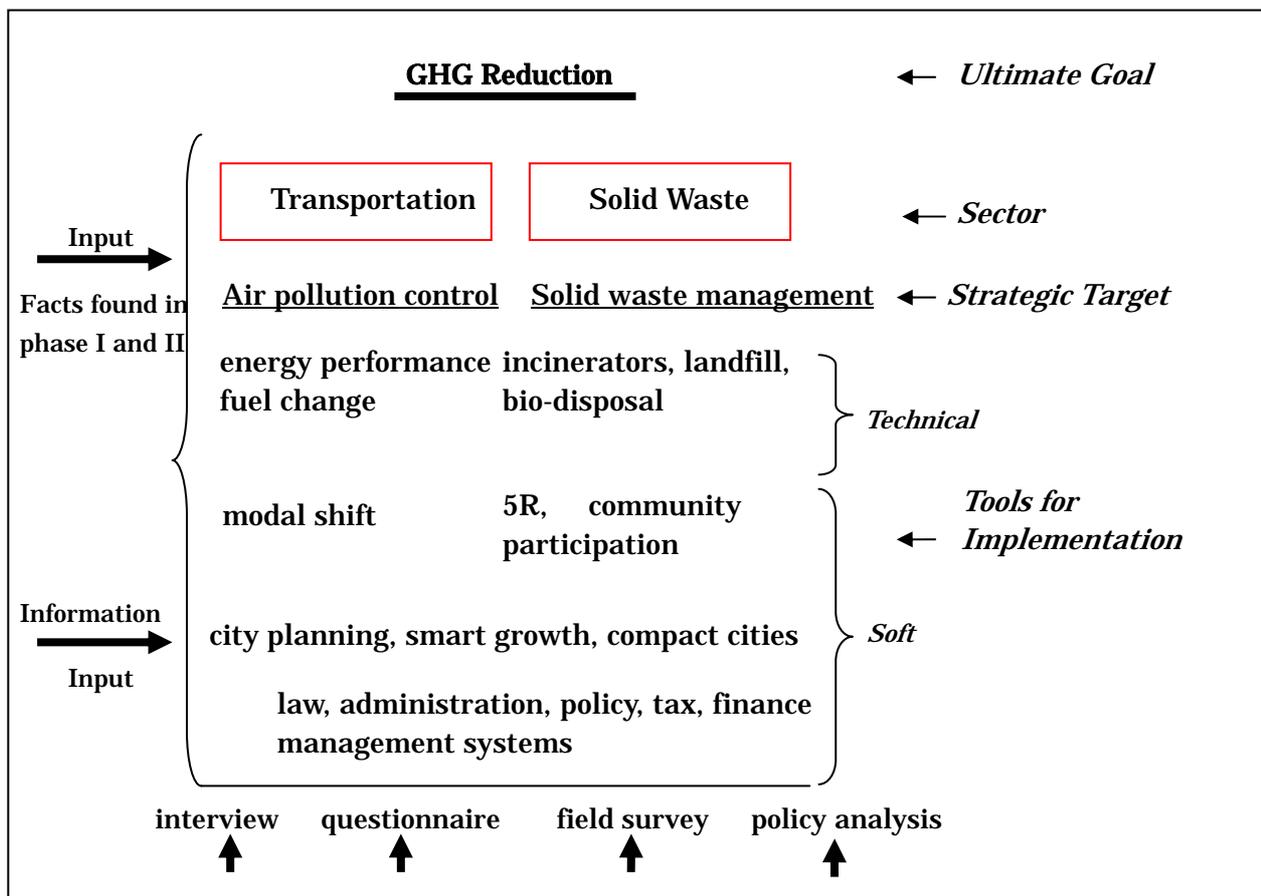


Fig. 1. Schematic design of the project

Transportation and waste management sectors present the most prominent environmental issues for cities in Asia. These sectors are found to be contributing to both local and global environmental concerns. The existing information on the Asian cities and various research outputs re-endorses

the fact that issues in these sectors need special attention in order for us to realise the environmental sustainability of cities. Hence, these two sectors are considered as *target sectors* for the present study. The transportation sector presents a wide range of issues viz. air pollution, noise, congestion, accidents and increased travel time. It was evident from the existing information that air pollution controls are not only important in the local context, but also have a higher potential to control greenhouse gas emissions. Asian developing cities, with the expected increase in growth rates, would eventually have to target greenhouse gas mitigation in the long term, if not immediately. Due to their importance and significant greenhouse gas mitigation potential, air pollution controls have been chosen as one of the *strategic targets* in the present study.

Solid waste as a sector has been contributing to various problems, viz. air pollution (due to waste burning), water pollution due to seepage, open dumping, unhygienic conditions and improper waste disposal. Solid waste management, among others, remains the most urgent priority for urban policy makers, and improved solid waste management would also make a substantial contribution to greenhouse gas emissions reduction. Therefore, it has been chosen as the second *strategic target* in the present study.

There is a growing belief that the developing countries, which may be able to afford to ignore the global concerns today, will have to take up the issue sooner or later. Thus, with an ultimate goal of greenhouse gas reduction, the present study has chosen air pollution control and waste management as strategic targets from the two important sectors due to their high greenhouse gas co-benefits. To achieve the set strategic targets, various technological measures and soft measures would be considered in order to develop effective strategies for their implementation. Technological measures would include energy performance, fuel change for air pollution control, and technologies for waste treatment, such as incineration, landfill, and composting. Soft measures considered for air pollution control would include modal shift and reduction of travel demand through urban planning, and the introduction of 5R, community participation and environmental management systems for betterment of waste management. Such strategic measures identified through this study for the control of air pollution and improvement in waste management would also control greenhouse gas emissions, helping the cities in Asia towards their sustainable development goals.

3.2 Sub-theme design – rationale, methodology, implementation arrangements, target stakeholders

(1) Transportation

In line with the above discussion on the schematic design of the proposal, this section presents the detailed research questions from the transport sector.

The crux of the transport-environment problem lies in the unprecedented growth of motorised private transportation, limited or inefficient public transportation, neglected non-motorised modes of transport, lack of mass transportation to cater to huge travel needs, poor energy-emission performance of automobiles, increased reliance on high polluting fuels, and poor urban planning practices. Planning and implementation of balanced approaches to air pollution control from the urban transportation is a major challenge for policy makers in Asian cities. Urban transportation poses serious problems both in the short term (in terms of local pollution) and the long term (in terms of greenhouse gas emissions), and it needs both short and long-term solutions. Shifting to cleaner modes and fuels, and making modes themselves cleaner might complement concerns on air pollution, greenhouse gases and energy use. As policy makers are primarily concerned with air pollution but not greenhouse gases, how to internalise such concerns into the area of air pollution is

a key question. In relation to the long-term approach, cities may need to adopt urban planning tools such as smart growth in order to reduce air pollution and greenhouse gas emissions. This approach is particularly useful for reducing energy use and emissions from mobile sources, since it can reduce the trip generation and vehicle travel.

The following three major issues are addressed in this study:

- Strategies for cleaner transportation in Asian cities – restraining private transportation, promoting public and mass transportation, and improving energy performance
- Strategies to improve the share of non-motorised transport and to increase the penetration of cleaner fuel in urban transportation
- Strategies to reduce trip generation through urban planning

The approach used in this study explores a wide domain of air pollution control options, both short and long-term, in urban transportation (including both curative and preventive options), identifies selected options that simultaneously reduce greenhouse gas (note that not all options have co-benefits), and studies these options in order to find ways to strengthen them in the short and long term, principally through three policy instruments, as appropriate: regulations, taxes and subsidies, and investments.

Methodology

The proposed research components under transportation will be carried out in four steps. In the first step, various transportation options that have both greenhouse gas and local emissions control potential will be identified based on the existing studies and facts that are already collected. As a second step, barriers and opportunities for the implementation of the selected options would be identified. This will be carried out based on personal interviews with focus groups such as city and national policy makers, personnel from industries and NGOs etc., and also from secondary sources such as existing reports and documents from cities, national governments and international institutions. Part three involves identification of various policy measures to remove their barriers, strengthen their opportunities, and achieve a better penetration of the identified potential options in the transport systems. This would be carried out by means of a questionnaire survey and policy dialogues. It would be limited to actors from the focus groups as listed above. The proposed study would be carried out in the following cities: Beijing, Bangkok, Bangalore, Dhaka and Mumbai.

In relation to the long term approaches, recent planning approaches such as 'smart growth' and 'compact cities' will be summarised since they have direct linkages to environmental concerns such as air quality control and greenhouse gas mitigation. For these planning approaches, the prerequisites to success will be studied in order to reduce trip generation, through looking at urban planning frameworks that include administrative, regulatory and financial aspects, and the process of planning. Upon collecting the prerequisites to success and surveying the measures for sustained implementation in the developed country cities, three case studies (Beijing, Seoul, and Mumbai) will be conducted. The case studies will be used to collect the categories of information mentioned above, which will be compared with the prerequisites observed in cities in developed countries. The collection of data will be conducted through personal communications with stakeholders, viz. national government, regional government, municipalities, the private sector, and civil society. Barriers and opportunities in applying the above-mentioned approaches in these cities will be identified, and policy recommendations will be presented.

(2) Solid Waste

Solid waste management is a serious local problem with global implications for resources, energy,

and greenhouse gas emissions. Methane emissions from open dumps and landfills are among the main sources of greenhouse gases in cities in developing countries. With economic growth and changes in lifestyle, both municipal and industrial solid wastes are expected to increase and present a bigger challenge for environmental managers at various government levels. Improvements in waste management in these cities are likely to improve the local environmental and sanitary conditions while having substantial co-benefits of greenhouse gas mitigation.

With the limited resources and increasing amount of waste in Asian cities, there is an increasing need for implementation of recycling and improved management in the waste sector. The 5R of Reduce, Reuse, Recycle, Recovery and Residual management, are at the centre of the Circular Economy concept, which represents an integrated perspective in the waste sector, enclosing upstream and downstream issues. In the year 2001, the Basic Law for Promotion of Sound Material Cycle Society was enacted in Japan, and 5R is an integral part of the law. A similar concept has been taken up by other Asian countries such as Korea, Singapore, and China. This momentum towards adopting the circular economy concept in Asian countries is due to the potential of integrating environmental concerns with the economic development that is witnessed in many Asian countries. Local governments are responsible for proper management of solid waste as well as the environmental concerns arising from the management, and implementing circular economy concept at the city level has the potential to improve solid waste management. Therefore, it is necessary to examine the potential, effectiveness, opportunities, and barriers for implementing 5R in Asian cities, and to provide policy recommendations.

Methodology

In this study, we propose to develop and prioritise a set of strategies necessary for the implementation of 5R in solid waste management in Asian cities. It will start by examining the current status and impacts of the implementation of the Basic Law for Promotion of Sound Material Cycle Society in Japanese cities, to clarify the possible implications. With this as a background, we will conduct case studies in five selected Asian cities to identify potentials, opportunities and barriers in implementing 5R in these cities. The case study cities we have chosen are Tokyo, Beijing, Manila, Bangkok, and Mumbai, which represent different geographical regions, economic development levels, and socio-cultural backgrounds in Asia. Different aspects of 5R will be addressed considering the features of the city in terms of solid waste management. Tokyo is the most developed, and the first city to have adopted and implemented the 5R concept; therefore, the role of the Tokyo case study will provide a basis to evaluate the effectiveness of 5R taking the Construction Waste Recycling Law as an example. China started to promote policies towards a circular economy, and thus Beijing case will provide a unique opportunity to explore the possibilities and barriers of introducing 5R in developing country cities. In the Manila case, we study the decision making process in the waste management sector (with particular focus on the recent prohibition of incineration) taking into considerations the social, economic and cultural context of the city. For many Asian developing cities, source separation was identified as a means for decreasing the amount of waste for residual management, and increasing the recycling rate. In Bangkok city, we will look at the barriers and opportunities for implementing source separation in municipal waste management, and analyse the cost-benefit of different technological choices for residual management. A similar approach will be taken for the Mumbai case. In each case study city, we will start by collecting information on the current status of waste disposal, recycling activities and systems by formal and informal sectors, management systems including treatment options, related legislation, and institutional arrangements. Furthermore, we will conduct

interviews with local practitioners and experts to evaluate the potential and readiness to adopt the circular economy concept in the solid waste management sector in the case study city. Some of the above information will be obtained through commissioned papers. Based on this information, we will conduct a synthesis analysis and present policy recommendations. Different aspects of 5R will be examined in each city, and as a whole the case studies will cover the 5R and provide a comprehensive picture of potentials, opportunities and barriers in implementing 5R, as well as policy recommendations for their implementation in Asian cities. A workshop and a policy dialogue will be organised in order to discuss the barriers and opportunities and disseminate the policy recommendations.

3.3 Inter-project collaboration

The project has prospects to collaborate with other projects in IGES to maximise resources and create greater impact. The following are potential (but tentative) collaborations on the basis of mutual interest:

- Climate Policy Project – greenhouse gas emission mitigation policies from urban transportation and Clean Development Mechanisms in the waste sector
- LTP – urban transportation issues
- IGES Thailand Office – support for case studies

3.4 Potential collaboration with outside institutes

Transportation: EMBARQ Project of the World Resources Institute, Asian Institute of Technology (AIT), Indira Gandhi Institute of Development and Research (IGIDR), World Bank, United States Environmental Protection Agency, National Institute of Environmental Studies, Tokyo Institute of Technology, The University of Tokyo

Solid waste: Asian Institute of Technology (AIT), Indira Gandhi Institute of Development and Research (IGIDR), The University of Tokyo, Tsinghua University, Chinese Academy of Sciences, International Society of Industrial Ecology, City Alliance

4. Expected Outcomes

The project will produce recommendations that are targeted at urban policy makers and other stakeholders in urban environmental management policy. They will be published as project reports, journal papers, book chapters, working papers, policy briefs, conference proceedings, etc.

Tentative list of expected reports:

- Strategies for the improvement and implementation of non-motorised transport and cleaner fuel options in urban transportation
- Strategies to promote cleaner transportation modes and improve energy efficiency of the automobile fleet in Asian cities
- Strategies to reduce trip generation through urban planning
- Strategies for improving solid waste management in Asian cities
- Final Synthesis project report

5. Activities and Schedules

Major activities for every three months are listed below:

Jun. 2005 – Sep. 2005

- Finalising research plan

- Data/info collection
- Drafting individual background papers
- Field surveys to case cities (Bangkok, Beijing, Mumbai)

Oct. 2005 – Dec. 2005

- IHDP Open Meeting
- Field surveys to case cities (Mumbai, Bangkok, Bangalore)

Jan. 2006 – Mar. 2006

- Drafting individual papers/reports
- Field surveys to case cities (Seoul, Manila, Bangkok, Mumbai)
- Prepare for a workshop on solid waste management

Apr. 2006 - Jun. 2006

- Finalising individual papers/reports
- Additional field surveys (Beijing, Bangkok)
- World Urban Forum III

Jul. 2006 - Dec. 2006

- International conference on cities and greenhouse gases
- Drafting synthesis paper
- Policy dialogue on potentials and barriers of introducing 5R in Asian cities

Jan. 2007 – Mar. 2007

- Finalising synthesis paper
- Publication (synthesis report and other papers/reports)

6. Monitoring Plans

In addition to the overall IGES progress review process, the project will hold brainstorming and informal discussions on specific problems at least once a month to cross check the progress and identify problems at an earlier stage. Every three months, it will hold a progress check meeting. If any significant delay is noticed, the members will get together to discuss the reasons and mitigation strategy – help from other researchers or using outside resources.

All project publications will be sent to outside reviewers for comments and suggestions.

7. Financial Aspects

Apart from staff salaries and office management costs, the internal funds for research available to the project are approximately JPY 33 million for fiscal year 2004, which is likely to continue for each year until 2007. In the past, the project has been successful in generating funds from outside organisations, foundations, national governments and local governments. The project will continue to work to procure outside funds for research activities. The project also has plans to approach several foundations in Japan and overseas.

An estimated budget plan for the coming two years (IGES budget only scenario) is listed below:

- Travel for meetings and field surveys: 12 million
 - Domestic: 2 million
 - International: 10 million

- **Workshops/Conferences: 30 million (workshops/roundtable/conference)**
- **Facilities and suppliers: 3 million**
- **Books, software and data purchases: 4 million**
- **Publication: 6 million**
- **Interns and visiting researchers: 6 million**
- **Commission papers and local collaborators: 6 million**
- **Miscellaneous: 2 million**

Total: 69 million JPY

This budget plan is based on the IGES internal source only. If external resources become available, the project would like to expand the fund for visiting researchers and local collaborators, as well as some fund for 4th phase planning activities.

